



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/776,346

02/12/2004

David S. Seiver

Serie 6464

1752

7590

06/15/2006

Linda K. Russell

Patent Counsel

Air Liquide

2700 Post Oak Blvd., Suite 1800

Houston, TX 77056

EXAMINER

EARLY, MICHAEL JACOBY

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

e

Office Action Summary	Application No. 10/776,346	Applicant(s) SEIVER ET AL.	
	Examiner Michael J. Early	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 7-9 and 16-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/12/04; 5/2/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 11 is objected to because of the following informalities:

- The claim references to “step (e)” of claim 10; however, upon reviewing referenced claim, there is no recitation of a step (e). The terms “...wherein step (e) further includes: (e.1) automatically controlling...” have been removed and replaced with “...wherein the step (d) further includes: (d.1) automatically controlling...”. The recommended alteration has been made to further the prosecution of this application.

Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Art Unit: 3744

Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 7 of U.S. Patent No. 6,622,521 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the both recite limitations comprising air intake, at least one distillation column, a crude argon column and a controller.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 and 10-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Al-Chalabi (U.S. 4,784,677).

Regarding claims 1-6, Al-Chalabi discloses:

- an air input subsystem (10 – conduit);
- at least one distillation column (2 – high pressure stage or lower column);
- a processed air stream (10 – conduit);
- a raw argon stream (46 – vapor outlet conduit);
- the at least one distillation column is located downstream from the air input system (as seen in Figure 1);
- a crude argon column (34 – crude argon column);
- a crude argon stream (48 – conduit);
- a controller (78, 80 – first controller, second controller);
- the controller further controls the composition of the crude argon stream to adjust an oxygen concentration of the crude argon stream toward a selected value (see col. 7, lines 1-5);

Art Unit: 3744

- the selected value for the oxygen concentration of the crude argon stream is not more than about 4% (col. 5, lines 55-58);
- the selected value for the oxygen concentration of the crude argon stream is not more than about 4 ppm (col. 5, lines 55-58);
- the selected value for the nitrogen concentration of the crude argon stream is less than about 5% (col. 5, lines 55-58);
- the controller is a multivariable predictive controller that effects control of at least one constraint variable and to at least one manipulated variable (see col. 7, lines 28-58).

Regarding claims 10-15, Al-Chalabi discloses:

- directing a flow of atmospheric air into the air intake subsystem (10 – conduit) and processing the atmospheric air (see col. 4, lines 12-21; Figure 1);
- directing the processed air from the air intake subsystem into at least one distillation column (2 – high pressure stage or lower column) to produce at least one raw argon stream (46 – vapor outlet conduit) (as seen in Figure 1);
- directing the at least one raw argon stream from the at least one distillation column to a crude argon distillation column (34 – crude argon column) to process the raw argon stream and to output a crude argon stream (48 – conduit) (as seen in Figure 1);
- automatically controlling the composition of the raw argon stream via the controller so as to decrease a concentration of oxygen in the raw argon stream while preventing a concentration of nitrogen in the crude argon stream from exceeding a selected value (see col. 7, lines 1-5);
- automatically controlling the composition of the crude argon stream until the oxygen concentration of the crude argon stream reaches a selected value (see col. 7, lines 1-5);
- the selected value for the oxygen concentration of the crude argon stream is not more than about 4.0 ppm (col. 5, lines 55-58);

Art Unit: 3744

- the selected value for the oxygen concentration of the crude argon stream is not more than about 4.0 ppm (col. 5, lines 55-58);
- the selected value for the nitrogen concentration of the crude argon stream is less than about 5% (col. 5, lines 55-58);
- the controller is a multivariable predictive controller that effects control of at least one constraint variable and at least one manipulated variable (see col. 7, lines 28-58).

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Howard et al. (U.S. 5,313,800).

Howard et al. disclose:

- an air input subsystem (10 – a source of compressed air);
- at least one distillation column (18 – low pressure column);
- a processed air stream (446 – cool, dry, high pressure air);
- a raw argon stream (35 – stream);
- the at least one distillation column is located downstream from the air input system (as seen in Figure 1);
- a crude argon column (36 – argon side arm column);
- a crude argon stream (37 – crude argon stream);
- a controller (50, 52 – master control loop, slave control loop).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3744

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

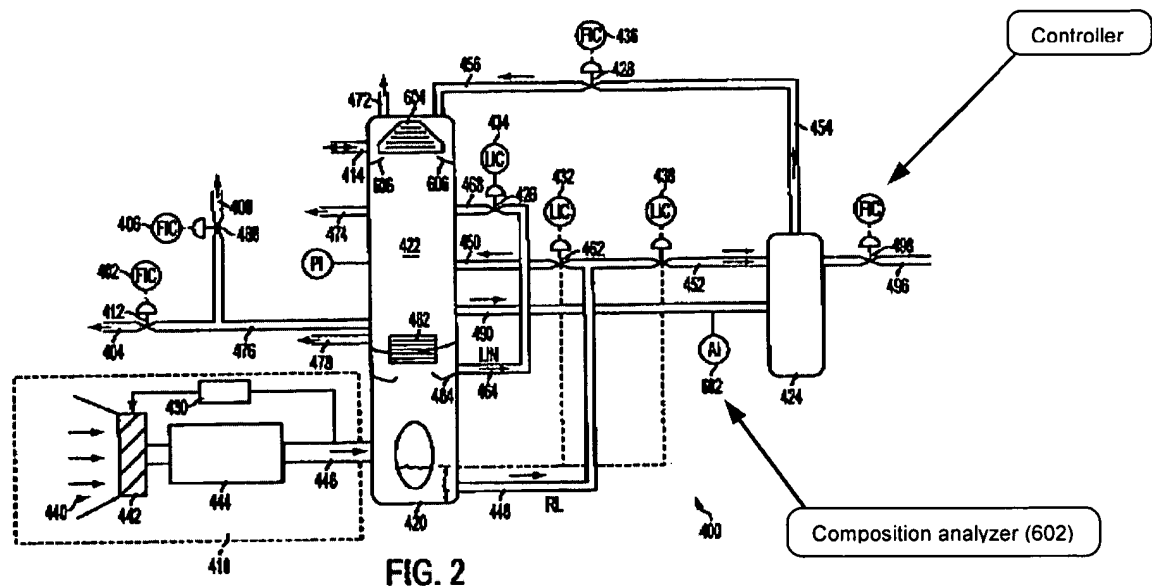
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seiver et al. (U.S. 6,622,521 B2).

Seiver et al. disclose:

- an air input subsystem (410 – air input subsystem);
- at least one distillation column (420 – high pressure cryogenic distillation column);
- a processed air stream (446 – cool, dry, high pressure air);
- a raw argon stream (490 – stream);
- the at least one distillation column is located downstream from the air input system (as seen in Figure 2);
- a crude argon column (424 – crude argon column);
- a crude argon stream (496 – argon-rich flow);

- a controller (as seen in the illustration of Figure 2 below).



However, Seiver et al. do not expressly disclose:

- details related to the controller;
- details related to the composition and concentration of the crude argon stream.

Seiver et al. further disclose a composition analyzer ("AI") (602) that is capable of monitoring the content or purity of argon as it passes through the system (see col. 6, lines 8-13; the illustration of Figure 2 above).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the existing system of Seiver et al. by incorporating a composition analyzer within the system's controller, so that less error will be associated with monitoring and regulating the produced argon-rich flow (496).

Art Unit: 3744

Regarding claim 3, at the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to make the selected value for the oxygen concentration of the crude argon stream not more than 4% because the Applicant has not disclosed that having the selected value for the oxygen concentration not more than 4% of the crude argon stream provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, therefore, would have expected the Applicant's invention to perform equally well with either the oxygen concentration level implicitly taught by Seiver et al. ('521) or the claimed 4% oxygen concentration because it is well known in the art for cryogenic air separation units to produce streams comprised of oxygen, nitrogen and argon (see col. 1, lines 17-25).

Regarding claims 4 and 5, the limitations associated with having an oxygen and nitrogen concentration not more than 4 ppm and 5%, respectively; can also be seen as an obvious matter of design choice and be rejected along the same lines as the aforementioned argument.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard et al.

Howard et al. disclose:

- the selected value for the oxygen concentration of the crude argon stream is not more than about 4.0 ppm (col. 4, lines 61-63);
- the selected value for the oxygen concentration of the crude argon stream is not more than about 4.0 ppm (col. 4, lines 61-63);
- the selected value for the nitrogen concentration of the crude argon stream is less than about 5% (col. 4, lines 61-63);

Art Unit: 3744

However, Howard et al. do not expressly disclose:

- details related to a controller.

As aforementioned, Howard et al. disclose a controller that is comprised of a master control loop and a slave control loop. Further disclosed is that the controller is used to monitor the nitrogen content within the crude argon stream (37) (see col. 7, lines 4-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the existing system of Howard et al. by measuring the oxygen content within in the argon product stream so that the system can optimize the amount of oxygen supplied to an end user.

Allowable Subject Matter

Claims 7-9 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Mikawa et al. (U.S. 3,912,476) teach of an air separating apparatus that is comprised of a major control unit and a plurality of minor control units.
- Cheng (U.S. 6,055,524) teach of a model-free adaptive controller that is capable of controlling a plurality of industrial processes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Early whose telephone number is (571) 272-3681. The examiner can normally be reached on Monday - Friday, 7am - 4:30pm.

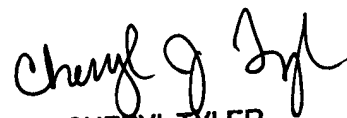
Art Unit: 3744

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJE
6/6/06

Michael J. Early
Patent Examiner
Art Unit 3744



CHERYL TYLER
SUPERVISORY PATENT EXAMINER